I. AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) An optoelectronic assembly ~~connector~~ comprising:

~~a) a mounting surface;~~

~~b)~~ an array of optoelectronic devices each ~~adapted to the mounting surface, the optoelectronic devices~~ having ~~at least~~ a first end;

~~c)~~ an array of optical elements each ~~, the array of optical elements~~ having ~~at least~~ a first end;

~~d)~~ the first end of an ~~the array of~~ optical element[[s]] being positioned relative to the first end of an ~~the array of~~ optoelectronic device[[s]] in such a manner that ~~one or more~~ the optical element[[s]] is optically aligned to ~~one or more~~ the optoelectronic device[[s]]; and

~~e) an adhesive dispensed~~ a binder disposed between the first end of the ~~array of~~ optoelectronic device[[s]] and the first end of the ~~array of~~ optical element[[s]] ~~, wherein the adhesive contacts~~ so that the binder secures the first end of ~~the array of~~ said optoelectronic device[[s and]]to the first end of the ~~array of~~ optical element[[s]].

2. (Currently Amended) An apparatus as in claim 1, wherein the binder is ~~adhesive comprises~~ an ~~UV optical~~ adhesive material.

3. (Currently Amended) An apparatus as in claim 1, wherein the binder ~~adhesive~~ comprises a gel.

4. (Currently Amended) An apparatus as in claim 1, wherein the binder ~~adhesive~~ provides mechanical stability.

5. (Currently Amended) An apparatus as in claim 1, further comprising a ~~wherein the~~ mounting surface ~~comprises a printed circuit board~~.

6. (Original) An apparatus as in claim 5, wherein the mounting surface comprises a flexible printed circuit board.

7. (Original) An apparatus as in claim 1, wherein the optoelectronic devices comprise vertical cavity surface emitting lasers.

8. (Original) An apparatus as in claim 7, wherein the optoelectronic devices comprise oxide vertical cavity surface emitting lasers.

9. (Original) An apparatus as in claim 1, wherein the optoelectronic devices comprise photo-detectors.

10. (Original) An apparatus as in claim 1, wherein the optical elements are packages in a ferrule.

11. (Original) An apparatus as in claim 10, wherein the ferrule comprises at least a first end, the first end having a recess passing along an axis of the array of optical elements.

12. (Original) An apparatus as in claim 10, wherein the ferrule comprises at least a first end, the first end having a recess that is proximate to an end of the array of optical elements.

13. (Currently Amended) An apparatus as in claim 1, further comprising an ~~second~~ adhesive surrounding at least a portion of the array of optical elements, the ~~second~~ adhesive capable of mechanically stabilizing the array of optical elements to the mounting surface and capable of providing moisture and electrical shielding.

14. (Currently Amended) An apparatus as in claim 5[[1]], further comprising a dam adapted to the mounting surface, the dam surrounding the array of optical elements.

15. (Currently Amended) An apparatus as in claim 13, further comprising a moisture barrier that surrounds the ~~second~~ adhesive.

16. (Original) An apparatus as in claim 15, wherein the moisture barrier provides electrical shielding.

17. (Currently Amended) An apparatus as in claim 13, further comprising an electrical shielding that surrounds the ~~second~~ adhesive.

18. (Original) As apparatus as in claim 17, wherein the electrical shielding provides moisture shielding.

19. (Currently Amended) An apparatus as in claim 1, further comprising a driver chip or amplifier chip ~~adapted to the mounting surface~~, the driver chip or amplifier chip in close proximity to the array of optoelectronic devices.

20. (Original) An apparatus as in claim 1, wherein the optical elements are optical fibers.

21. (Original) An apparatus as in claim 1, wherein the optical elements are lenses.

22. (Original) An apparatus as in claim 1, wherein the array of optical elements is a lenslet array.

23. (Original) An apparatus as in claim 1, wherein the optical elements are diffractive optical elements.

24. (Original) An apparatus as in claim 1, wherein the optical elements are filters.

25 to 49 (Canceled).

50. (Currently Amended) An optoelectronic ~~connector~~ assembly comprising:

~~a) a mounting surface;~~

a[[b]]) an array of optoelectronic devices ~~adapted to the mounting surface, the optoelectronic devices having at least a first end~~;

b[[c]]) an array of optical elements~~, the array of optical elements having at least a first end~~;

c[[d]]) the ~~first end of the~~ array of optical elements positioned relative to the ~~first end of the~~ array of optoelectronic devices in such a manner that one or more optical elements in optically aligned to one or more optoelectronic devices; and

d[[e]]) ~~a solidifying material surrounding at least the array of optical elements, the solidifying material capable of~~ means for mechanically stabilizing the array of optical

elements with respect to the position of the array of optoelectronic devices ~~to the mounting surface~~.

51. (Currently Amended) An apparatus as in claim 50, wherein the means for mechanically stabilizing further includes means for encapsulating ~~solidifying material encapsulates~~ at least one electrical or optoelectronic component ~~adapted to the mounting surface~~.

52. (Currently Amended) An apparatus as in claim 50, wherein the means for mechanically stabilizing further includes means for ~~solidifying material is capable of~~ providing moisture or electrical shielding.

53. (Currently Amended) An apparatus as in claim 50, wherein the means for mechanically stabilizing further includes means for adhering at least one optoelectronic device to at least one optical element ~~solidifying material comprises an adhesive~~.

54. (Currently Amended) An apparatus as in claim 53, wherein the means for mechanically stabilizing includes means for utilizing ~~solidifying material comprises an~~ UV optical adhesive.

55. (Currently Amended) An apparatus as in claim 50, wherein the means for mechanically stabilizing includes means for ~~solidifying material is capable of~~ providing an optical path ~~and is capable of providing mechanical stability~~.

56. (Currently Amended) An apparatus as in claim 50, wherein the means for mechanically stabilizing includes means for ~~solidifying material is capable of~~ functioning as an attenuator.

57. (Currently Amended) An apparatus as in claim 50, further comprising a ~~wherein the~~ mounting surface ~~comprises a printed circuit board~~.

58. (Original) An apparatus as in claim 57, wherein the mounting surface comprises a flexible printed circuit board.

59. (Original) An apparatus as in claim 50, wherein the optoelectronic devices comprise vertical cavity surface emitting lasers.

60. (Original) An apparatus as in claim 59, wherein the optoelectronic devices comprise oxide vertical cavity surface emitting lasers.

61. (Original) An apparatus as in claim 50, wherein the optoelectronic devices comprise photo-detectors.

62. (Currently Amended) An apparatus as in claim 50, wherein the optical element is ~~are~~ packaged in a ferrule.

63. (Original) An apparatus as in claim 62, wherein the ferrule comprises at least a first end, the first end having a recess passing along an axis of the array of optical elements.

64. (Original) An apparatus as in claim 62, wherein the ferrule comprises at least a first end, the first end having a recess that is proximate to an end of the array of optical elements.

65. (Currently Amended) An apparatus as in claim 50, further comprising a driver chip or amplifier chip ~~adapted to the mounting surface~~, the driver chip or amplifier chip in close proximity to the array of optoelectronic devices.

66. (Original) An apparatus as in claim 50, wherein the optical elements are optical fibers.

67. (Original) An apparatus as in claim 50, wherein the optical elements are lenses.

68. (Original) An apparatus as in claim 50, wherein the array of optical elements is a lenslet array.

69. (Original) An apparatus as in claim 50, wherein the optical elements are diffractive optical elements.

70. (Original) An apparatus as in claim 50, wherein the optical elements are filters.

71. (Currently Amended) An optoelectronic assembly ~~connector~~ comprising:

~~a) a mounting surface;~~

~~b)~~ an array of optoelectronic devices each ~~adapted to the mounting surface, the optoelectronic devices~~ having ~~at least~~ a first end;

~~c)~~ an array of optical elements each ~~, the array of optical elements~~ having ~~at least~~ a first end;

~~d)~~ the first end of an ~~the array of~~ optical element[[s]] being positioned relative to the first end of an ~~the array of~~ optoelectronic device[[s]] in such a manner that the ~~one or more~~ optical element[[s]] is optically aligned to the ~~one or more~~ optoelectronic device[[s]]

with an air gap between the first end of the optoelectronic device and the first end of the optical element~~; and~~

~~e) a gap formed between the first end of the array of optoelectronic devices and the first end of the array of optical elements~~.

72. (Currently Amended) An apparatus as in claim 71, further includes a ~~wherein the~~ mounting surface ~~comprises a printed circuit board~~.

73. (Currently Amended) An apparatus as in claim 72[[1]], further comprising a spacer adapted to the mounting surface, the spacer capable of forming the gap between the first end of an ~~the array of~~ optoelectronic device[[s]] and the first end of an ~~the array of~~ optical element[[s]].

74. (Currently Amended) An apparatus as in claim 72[[1]], wherein the mounting surface comprises a flexible printed circuit board.

75. (Original) An apparatus as in claim 71, wherein the optoelectronic devices comprise vertical cavity surface emitting lasers.

76. (Original) An apparatus as in claim 71, wherein the optoelectronic devices comprise oxide vertical cavity surface emitting lasers.

77. (Original) An apparatus as in claim 71, wherein the optoelectronic devices comprise photo-detectors.

78. (Original) An apparatus as in claim 71, wherein the optical elements are packaged in a ferrule.

79. (Original) An apparatus as in claim 78, wherein the ferrule comprises at least a first end, the first end having a recess passing along an axis of the array of optical elements.

80. (Original) An apparatus as in claim 78, wherein the ferrule comprises at least a first end, the first end having a recess that is proximate to an end of the array of optical elements.

81. (Currently Amended) An apparatus as in claim 71, wherein the air gap optimizes the optical coupling and alignment tolerances for a given set of optoelectronic devices and optical element characteristics.

82. (Currently Amended) An apparatus as in claim 71, further comprising a first adhesive dispensed between the first end of the array of optoelectronic devices and the first end of the array of optical elements, wherein the first adhesive adheres ~~contacts~~ the first end of the array of optoelectronic devices to ~~and~~ the first end of the array of optical elements.

83. (Original) An apparatus as in claim 82, wherein the first adhesive is a gel.

84. (Currently Amended) An apparatus as in claim 72[[1]], further comprising a dam adapted to the mounting surface, the dam surrounding the array of optical elements.

85. (Currently Amended) An apparatus as in claim 72[[1]], further comprising a second adhesive surrounding at least a portion of the array of optical elements, the second adhesive

is capable of mechanically stabilizing the array of optical elements to the mounting surface and is capable of providing moisture and electrical shielding.

86. (Original) An apparatus as in claim 85, further comprising a moisture barrier that surrounds the second adhesive.

87. (Original) An apparatus as in claim 86, wherein the moisture barrier provides electrical shielding.

88. (Original) An apparatus as in claim 85, further comprising an electrical shielding that surrounds the second adhesive.

89. (Original) An apparatus as in claim 88, wherein the electrical shielding provides moisture shielding.

90. (Currently Amended) An apparatus as in claim 72[[1]], further comprising a driver chip or amplifier chip adapted to the mounting surface, the driver chip or amplifier chip in close proximity to the array of optoelectronic devices.

91. (Original) An apparatus as in claim 71, wherein the optical elements are optical fibers.

92. (Original) An apparatus as in claim 71, wherein the optical elements are lenses.

93. (Original) An apparatus as in claim 71, wherein the array of optical elements is a lenslet array.

94. (Original) An apparatus as in claim 71, wherein the optical elements are diffractive optical elements.

95. (Original) An apparatus as in claim 71, wherein the optical elements are filters.

96 to 117. (Withdrawn)

118. (Currently Amended) An optoelectronic assembly ~~connector~~ comprising:

~~a) a mounting surface.~~

~~b)~~ an array of optoelectronic devices ~~adapted to the mounting surface, the optoelectronic devices~~ each having ~~a least~~ a first end;

~~c)~~ an array of optical elements each~~, the array of optical elements~~ having ~~at least~~ a first end;

~~d)~~ the first end of an ~~the array of~~ optical elements proximate to the first end of an ~~the array of~~ optoelectronic devices in such a manner that said ~~one or more~~ optical element[[s]] is optically aligned to said ~~one or more~~ optoelectronic device[[s]]; and

~~e)~~ a spacer having a first surface and a second surface, wherein the first surface of the spacer is coupled to a mounting surface and the second surface of the spacer is coupled to the optoelectronic devices ~~to the mounting surface, a first end of the spacer proximate to the first end of the array of optical elements~~.

119. (Original) An apparatus as in claim 118, wherein the spacer is capable of creating a interstitial space between the first end of the array of optical elements and the first end of the array of optoelectronic devices.

120. (Original) An apparatus as in claim 118, further comprising a first non-opaque material dispensed between the first end of the array of optoelectronic devices and the first end of the array of optical elements and dispensed on at least a portion of the spacer, wherein the first non-opaque material contacts the first end of the array of optoelectronic devices, the first end of the array of optical elements and at least a portion of the spacer.

121. (Original) An apparatus as in claim 120, wherein the first non-opaque material comprises an adhesive.

122. (Original) An apparatus as in claim 121, wherein the first non-opaque material comprises an UV optical adhesive.

123. (Currently Amended) An apparatus as in claim 120[[18]], wherein the first non-opaque material comprises a gel.

124. (Currently Amended) An apparatus as in claim 120[[18]], wherein the first non-opaque material is capable of providing an optical path and to provide mechanical stability.

125. (Original) An apparatus as in claim 118, wherein the mounting surface comprises a printed circuit board.

126. (Original) An apparatus as in claim 125, wherein the mounting surface comprises a flexible printed circuit board.

127. (Original) An apparatus as in claim 118, wherein the optoelectronic devices comprise vertical cavity surface emitting lasers.

128. (Original) An apparatus as in claim 127, wherein the optoelectronic devices comprise oxide vertical cavity surface emitting lasers.

129. (Original) An apparatus as in claim 118, wherein the optoelectronic devices comprise photo-detectors.

130. (Original) An apparatus as in claim 118, wherein the optical elements are packaged in a ferrule.

131. (Original) An apparatus as in claim 130, wherein the ferrule comprises at least a first end, the first end having a recess passing along an axis of the array of optical elements.

132. (Original) An apparatus as in claim 131, wherein the ferrule comprises at least a first end, the first end having a recess that is proximate to an end of the array of optical elements.

133. (Original) An apparatus as in claim 118, further comprising a dam adapted to the mounting surface, the dam surrounding the array of the optical elements.

134. (Original) An apparatus as in claim 118, further comprising a second adhesive surrounding at least a portion of the array of optical elements, the second adhesive is capable of mechanically stabilizing the array of optical elements to the mounting surface and is capable of providing moisture and electrical shielding.

135. (Original) An apparatus as in claim 134, further comprising a moisture barrier that surrounds the second adhesive.

136. (Original) An apparatus as in claim 135, wherein the moisture barrier provides electrical shielding.

137. (Original) An apparatus as in claim 134, further comprising an electrical shielding that surrounds the second adhesive.

138. (Original) An apparatus as in claim 137, wherein the electrical shielding provides moisture shielding.

139. (Original) An apparatus as in claim 118, further comprising a driver chip or amplifier chip adapted to the mounting surface, the driver chip or amplifier chip in close proximity to the array of the optoelectronic devices.

140. (Original) An apparatus as in claim 118, wherein the optical elements are optical fibers.

141. (Original) An apparatus as in claim 118, wherein the optical elements are lenses.

142. (Original) An apparatus as in claim 118, wherein the array of optical elements is a lenslet array.

143. (Original) An apparatus as in claim 118, wherein the optical elements are diffractive optical elements.

144. (Original) An apparatus as in claim 118, wherein the optical elements are filters.

REMARKS

Claims 25-49 have been canceled without prejudice to pursue the subject matter in different continuation applications. Claims 1-24, 50-95, and 118-144 are currently pending in the application. Claims 1-5, 13-15, 19, 50-57, 65, 71-74, 81-82, 84-85, 90, 118, and 123-124 have been amended to further distinguish the present invention from the cited references. No new matter has been added. The amendment is made without acquiescence to the Examiner's reasons for rejection or prejudice to pursue the subject matter in a related application. Reconsideration of this application in light of this amendment is respectfully requested.

Claim Rejections under 35 USC § 103

The Office Action mailed on December 22, 2003 has rejected Claims 1-95 and 118-144 under 35 USC § 103(a) as being unpatentable over Miura et al. (U.S. Pat. No. 6,170,996), hereinafter called "Miura", in review of Simonis et al. (1 Gb/s VCSEL), hereinafter called "Simonis". Without admitting that Miura and Simonis are prior art and reserving the right to establish that Miura and Simonis are not prior art, Applicants respectively disagree with the Office Action's rejection. Applicants further disagree with numerous "well-known" assertions made in the Office Action and server the right to dispute the "well-known" assertions.

In order to expedite the allowance of the present application, numerous claims have been amended to further distinguish the present invention from Miura and Simonis. For example, amended Claim 1 recites in part:

> a binder . . . secures the first end of said optoelectronic device to the first end of the optical element.

Also, amended Claim 71 recites in part:

> an air gap between . . . the optoelectronic device and . . . the optical element.

Contrary to the present invention, Miura discloses a single channel optical module in which the "ferrule 26 is inserted in the sleeve 22 so as to abut against the convex portion 18a of the silicone resin 18." See column 5, lines 37-39 of Miura. Miura essentially teaches a technique of abutting between the silicone resin and the ferrule. On the other hand, Simonis teaches a schematic of a parallel-channel point-to-point optical interconnect configuration. Accordingly, neither Miura nor Simonis, alone or in combination, disclose, teach or suggest a binder or an air gap as claimed in the present application.

At least for the above-stated reasons, Applicants respectfully submit that Claims 1 and 71 are patentable over Miura in view of Simonis under §103. Since Claims 50 includes similar limitations as Claim 1, Claim 50 should also be patentable over Miura in view of Simonis. Furthermore, since Claims 2-24, 51-70, and 72-95 depend from Claims 1, 50, and 71, respectively, Claims 2-24, 51-70, and 72-95 should also be patentable over Miura in view of Simonis.

Amended Claim 118 recites in part:

> a spacer . . . wherein the first surface of the spacer is coupled to a mounting surface and the second surface of the spacer is coupled to the optoelectronic devices.

Neither Miura nor Simonis, alone or in combination, disclose, teach or suggest a spacer that is situated between a mounting surface and an optoelectronic device. At least for this reason, Applicants submit that Claim 118 is patentable over Miura in view of Simonis under §103. Since Claims 119-144 depend from Claim 118, Claims 119-144 should also be patentable over Miura in view of Simonis under §103.

CONCLUSION

Based on all of the above, Applicants believe all claims now pending in the present application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If there are any additional charges concerning this response, please charge to White & Case LLP Deposit Account 23-1703. Applicants thank the Examiner for carefully examining the present application and if a telephone conference would facilitate the prosecution of this application, the Examiner is invited to contact Jim Wu at (650) 213-0300.

Respectfully submitted,

Dated: May 24, 2004

By: _____

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